

Malfunctioning Postgastrectomy Stoma

Diagnosis and Treatment

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OF ALL COMPLICATIONS following gastric operations, failure of the efferent or exodic stoma to function properly is probably the most frequent. In the majority of cases, patients with this condition can be managed by conservative measures. It is to be stressed, however, that the particular circumstances in each case of postoperative gastric retention must be carefully appraised and that prompt surgical intervention must be in readiness if customary conservative measures do not bring about improvement.

Malfunction of the efferent stoma can occur after gastroduodenal or gastrojejunal anastomosis of any type. Mechanical difficulties at or distal to the stoma seem to be sufficiently common whether the anastomosis is done antecolic or retrocolic or whether it is placed antiperistaltic or isoperistaltic. In the immediate postoperative period, the addition of vagotomy to subtotal resection or gastrojejunostomy further adds to the difficulties of the stomach to empty properly. Prohaska⁶ postulated that subtotal gastrectomy with antiperistaltic gastrojejunostomy—that is, placing the efferent jejunal loop at the lesser curvature—is more likely to lead to gastric retention than is isoperistaltic anastomosis. The authors agree with him and feel that his concept of isoperistaltic and antiperistaltic is correct. Attempts to prevent this complication can be made by use of the Alesen T-tube (with which the authors have had little experience) or by passing an Einhorn tube through the anastomosed area into the distal jejunum and giving feedings through the lower openings and aspirating the stomach through the upper openings. The authors' experience with this method has not been too satisfactory. Gastroduodenostomy, or the so-called Billroth I operation, may also lead to a malfunctioning stoma.

Malfunctioning efferent stoma, or severe gastric retention occurring in the immediate postoperative phase, has been attributed to many factors. Edema at the site of anastomosis has been mentioned as a major cause, and the edema has been considered,

• Individualization in the treatment of patients with malfunctioning gastrojejunostomy stomas is paramount. Prompt surgical intervention in critically ill patients is necessary to save life.

In the early postoperative phase, the use of barium studies is disappointing and very seldom gives information as to the actual site of the obstruction.

In surgical treatment, operation directly upon the stoma should be avoided as much as possible. The release of small bowel obstruction, the reduction of intussusception or the correction of retraction of the jejunum through the mesocolon can be accomplished readily. Double or single jejunostomy for feeding and decompression are all that is necessary in cases in which no cause can be found for obstruction at or below the stoma.

In a patient with peptic ulcer, the use of enteroenterostomy below the stoma is unphysiological and will predispose to gastrojejunal ulcer at a later date.

variously, to be due to a lowered serum protein, particularly the albumin fraction; to an inflammatory reaction at the suture line; and, according to Roberts⁷ to low intracellular potassium. Mechanical conditions producing obstruction at or near the stoma can come from acute pancreatitis, anastomotic leakage, volvulus of the small bowel, excessive angulation of the jejunum at the greater or lesser curvature, too small a stoma with secondary inflammatory reaction, retraction of the line of anastomotic juncture through the transverse mesocolon in the retrocolic type, a rigid and short mesocolon which fails to stretch on filling of the stomach and thereby causes too short a proximal loop, retrograde intussusception of the jejunum through the anastomosis, or pressure of the middle colic artery when the anastomosis is placed to the right of the artery.

Management of a malfunctioning stoma consists of adequate gastric decompression and in replacement of fluid, electrolytes and protein. The use of roentgen examination with barium swallow is almost universally disappointing in determining whether or not the obstruction is at the stoma or distal to it. The older the patient, the poorer the nutrition and general status, the shorter can be the length of con-

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servative treatment. Waiting 30 to 60 days for stomas to open would seem to be putting too much reliance on wishful thinking.

TREATMENT

Sachs⁸ advocated that a Levin tube with a weighted mercury bag be passed through the stoma. The authors' experience in two cases with this method has been completely unsatisfactory. In neither case could the bag be passed through the stoma. Both patients made uneventful recovery several days later without surgical intervention.

The nature of the operative treatment depends upon the conditions observed within the abdomen. Retraction of the jejunum through the mesocolon can be simply corrected. If there are adhesions in the efferent jejunal loop severe enough to cause obstruction of the small bowel, freeing them may be all that is necessary to relieve the dysfunction. In one case in which posterior anastomosis was done, severe recurrent pancreatitis brought about so much fat necrosis that at reoperation the anastomosis was undone and a new one was done anterior to the colon. This, it is believed, was a life-saving procedure in this case and the patient remained well thereafter.

As far as operation upon the stoma itself is concerned, one must consider jejunoplasty, described by Hoag,⁵ or intragastric widening of the stoma, as reported by Sawyer and Spencer,⁹ as being the most logical procedures. Jejunoplasty has the disadvantage of directing the alkaline contents of the duodenum below the stoma and may predispose to gastrojejunal ulcer. Operation upon the stoma itself may be extremely difficult if inflammatory reaction is present.

In the authors' experience the use of a single-feeding jejunostomy, placed approximately eight to twelve inches below the stoma, has been adequate to control this problem. Joyce advocated and used this method many years ago and results were so favorable that he frequently used it as a complementary procedure in patients who had gastric resection and who were malnourished or who had had extensive hemorrhage. During the last few years, the authors have added the second retrograde jejunostomy for decompression of the stomach, as suggested by Allen and Donaldson,¹ for this seems to be much better tolerated by the patient than a Levin tube for a long period of time.

Another method of solving this problem, in addition to direct operation on the stoma, consists of enteroenterostomy below the stoma. This procedure was advocated by Prohaska and Cole.² Recently, Colp³ also recommended it for use in cases in which the stoma appears normal at the time of exploration but does not function properly. Colp described in

detail a case in which enteroenterostomy was performed and, in addition, a feeding-type jejunostomy. He said that the enteroenterostomy did not relieve the patient's symptoms but that after feeding was carried out through the jejunostomy for some days, the stomach began to empty normally. Undoubtedly, the feeding jejunostomy was the procedure that gave the patient relief. The authors believe that use of enteroenterostomy in the treatment of malfunctioning gastrojejunal stoma is to be condemned and that when this operation is done, gastrojejunal ulcer may develop later. This procedure is actually a modification of the Mann-Williamson experimental operation. Dragstedt^{4, 10} observed that vagotomy protected about one-half of dogs that had had the Mann-Williamson operation from stomal ulcer; that resection of the gastric antrum protected two-thirds of these animals from stomal ulcer; and that vagotomy and antrectomy, combined, were even more effective. Therefore, the use of enteroenterostomy for malfunctioning stoma is unphysiological except for patients on whom vagotomy and subtotal resection, including antrectomy, have been performed. It is obvious that only a small proportion of patients with malfunctioning stoma will be of that category.

REPORTS OF CASES

Group I

The following case illustrates obstruction at the stoma, probably due to stomal edema, in a patient who had had posterior Hofmeister gastrojejunostomy.

CASE A. A 54-year-old oil company executive with proven peptic ulcer of two years' duration was admitted to hospital May 23, 1949, with melena and hematemesis. The blood that was lost was replaced and the bleeding subsided. Subtotal gastrectomy and posterior Hofmeister gastrojejunostomy were carried out. Bile was obtained in the gastric contents during the first six postoperative days. Then, for five days, there was no bile in the material. X-ray examination with barium swallow showed obstruction of the stoma. Electrolytes and serum proteins were normal. A Harris tube weighted with 6 cc. of mercury did not pass through the stoma in 48 hours. Suction was continued. At this time (the eleventh postoperative day) the stomach started to empty and bile was contained in the material removed by suction.

The next case illustrates the diagnosis and management of stomal edema late in the postoperative course, following subtotal gastrectomy with anterior Hofmeister gastrojejunostomy.

CASE B. A 41-year-old electrician was admitted to hospital April 27, 1954, with a history of recurrent peptic ulcer for the preceding three and a half years. Response to conservative therapy had been unsatisfactory. Subtotal gastrectomy with a Hof-

meister anterior gastrojejunostomy was done April 28. Two weeks after operation the patient was readmitted with epigastric distress, relieved by vomiting, of two days' duration. On admission, electrolyte values were within normal limits. No barium passed through the stoma during fluoroscopy. Constant Levin tube suction was applied for three days. Then progressively a postgastrectomy diet was given and the patient recovered. He was discharged from the hospital in November, 1954.

The following case illustrates the diagnosis and management of stomal edema late in the postoperative course after subtotal gastrectomy with Billroth I gastroduodenostomy.

CASE C. A 71-year-old retired man was admitted to hospital January 24, 1954, for removal of gastric polyps, diagnosed by gastrointestinal x-ray examination. A subtotal gastrectomy with Billroth I gastroduodenostomy was done. The patient made uneventful recovery and was discharged on the seventh postoperative day. He was readmitted three weeks later with gastric retention and vomiting of ten days' duration. Upon examination with barium swallow, gastric retention was observed at first, but after an hour a large portion of the barium passed through the small bowel. Electrolytes and serum protein values were within normal limits. Levin tube suction was carried out for seven days and the patient made uneventful recovery.

Group II

The first case in this group illustrates the diagnosis and management of an efferent loop obstruction distal to the stoma in an anterior Polya gastrojejunostomy.

CASE A. A 41-year-old aircraft engineer was admitted on November 21, 1954, with a history of peptic ulcer of seven years' duration. A subtotal gastrectomy with an anterior Polya gastrojejunostomy was performed on November 24. A Levin tube with constant suction was used for three days. Gastric contents were bile-colored and averaged 600 to 700 cc. daily. The Levin tube was removed and the patient was given a postgastrectomy diet beginning on the fourth postoperative day. Gastric retention developed, with vomiting from the eighth to the twenty-third postoperative day. At this time, x-ray examination with barium swallow revealed a patent proximal stoma with an obstruction at the distal stoma and considerable distention of the stomach. The electrolyte values and albumin-globulin ratio were within normal limits. Reoperation was done on the twenty-third postoperative day. Dense adhesions extending from the liver and pancreas to 3 to 4 cm. distal to the efferent stoma were divided. A double-catheter jejunostomy was performed. Both catheters were removed on the eleventh postoperative day. The patient made uneventful recovery.

The following case illustrates the diagnosis and management of stomal edema and inflammation that

progressed to diaphragm formation and brought about obstruction in an anterior Polya gastrojejunostomy.

CASE B. The patient, a 69-year-old Italian vintner, had a long history of duodenal ulcer and chronic bronchitis. In December 1949 a posterior gastrojejunostomy with subdiaphragmatic vagotomy was done for duodenal obstruction from chronic duodenal ulcer. The vagotomy was known to be incomplete because of technical difficulties that arose during the procedure. The patient remained well for two years after the operation, then had massive hemorrhage from a gastrojejunal ulcer. He was admitted to hospital and there received 4,000 cc. of blood during the first 12 hours. Subtotal gastrectomy with an anterior Polya gastrojejunostomy was performed on April 20, 1951. Increasing gastric retention developed immediately. Upon barium swallow examination, obstruction of the stomach was observed. Serum proteins and electrolyte values were within normal limits. A week after operation a Witzel feeding jejunostomy was performed. At that time the stoma was not abnormal. Gastric retention continued and x-ray examination showed the stomach still obstructed. Twelve days after the jejunostomy, a stomal diaphragm was excised and a partial Noble plication was performed on a portion of proximal jejunum. The patient made uneventful recovery.

The next case illustrates the diagnosis and management of an efferent loop obstruction by adhesions in a posterior Hofmeister gastrojejunostomy.

CASE C. A 62-year-old oil company executive was admitted January 18, 1950, with a history of intractable duodenal ulcer with partial obstruction for the preceding 18 years. At operation the following day the ulcer was found to have penetrated the pancreas. Subtotal gastrectomy with a posterior Hofmeister gastrojejunostomy was performed. On the eighth postoperative day, gastric retention developed. Barium swallow examination showed a completely obstructed stomach. Electrolyte values and total serum proteins were within normal limits. A Harris tube with 6 cc. of mercury did not pass through in 48 hours. On the sixteenth postoperative day laparotomy was carried out and the efferent loop was observed to be obstructed by adhesions just distal to the stoma. Jejunoplasty was performed. The patient made uneventful recovery except for persistent hiccough which was relieved by phrenic crush (left).

The following case illustrates the diagnosis and management of an efferent loop obstruction due to an inflammatory reaction from acute pancreatitis in a subtotal gastrectomy with posterior Hofmeister gastrojejunostomy.

CASE D. A 32-year-old fireman was admitted January 30, 1951, with a history of peptic ulcer and tarry stools intermittently for 16 years. Subtotal gastrectomy, including excision of a posterior pene-

trating ulcer, with posterior Hofmeister gastrojejunostomy was done. Gastric retention developed on the tenth postoperative day. Barium swallow examination showed patent stoma. Serum amylase and urinary diastase were considerably above normal. Vomiting continued and on the sixteenth postoperative day a roentgen examination with barium swallow showed a completely obstructed stoma. The electrolyte values and total serum proteins were within normal limits. Laparotomy was carried out on the eighteenth postoperative day. Extensive fat necrosis and inflammatory reaction and edema of the mesocolon around the site of anastomosis were observed. The anastomotic area was freed from adjacent constriction and an Einhorn tube was passed into the distal jejunum. On the sixth postoperative day the tube was removed. Gastric retention immediately developed. Elevated serum amylase and results of urinary diastase studies indicated pancreatitis was still present. Twenty-three days after the second operation, a barium swallow study showed the stoma completely obstructed. Electrolyte values and total serum proteins were within normal limits. The abdomen was opened again and it was observed that dense adhesions about the stoma were causing complete obstruction of the efferent loop of the jejunum distal to the anastomosis. The anastomosis was

undone and a re-resection with an anterior Hofmeister gastrojejunostomy was performed. The patient made uneventful recovery.

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REFERENCES

1. Allen, A. W., and Donaldson, G.: Jejunostomy for decompression of the postoperative stomach, *Surg.*, 15:565, April 1944.
2. Cole, W. H.: Discussion of references 1 and 9.
3. Colp, R., and Weinstein, V.: Postoperative complications following subtotal gastrectomy for peptic ulcer, *Surg. Clin. of No. Amer.*, page 383, April 1955.
4. Dragstedt, L. R.: Personal communication.
5. Hoag, C. L., and Saunders, J. B.: Obstruction following gastroenterostomy or subtotal resection of the stomach: Treatment by jejunoplasty, *A.M.A. Arch. Surg.*, 42:259, Feb. 1941.
6. Prohaska, J., Govostis, M., and Kisteens, A.: Mechanism of the efferent stoma dysfunction following subtotal gastrectomy, *A.M.A. Arch. Surg.*, 68:491, April 1954.
7. Roberts, J.: Personal communication.
8. Sachs, A. E.: Treatment of postgastrectomy obstructed exit stoma, *A.M.A. Arch. Surg.*, 70:443, March 1955.
9. Sawyer, K. C., and Spencer, J. R.: Management of three stomal complications following subtotal gastrectomy, *A.M.A. Arch. Surg.*, 68:500, April 1954.
10. Storer, E. H., Woodward, E. R., and Dragstedt, L. R.: The effect of vagotomy and antrum resection on the Mann-Williamson ulcer, *Surg.*, 27:526, April 1950.

